

**The International Conference  
Advanced Materials Week – 2015  
AMW 2015**

**P R O G R A M**

**June 15-21, 2015**

**Togliatti – St. Petersburg, Russia**

## Part 1: Conference section in Togliatti

**Togliatti State University, Belorusskaya Str 14B, Togliatti  
15 June-16 June 2015**

### **15 June 2015 (Park Hotel, Togliatti)**

08.00–09.00 Registration

09.00–09.05 Opening remarks (A. Vinogradov, Togliatti State University)

09.05–09.10 Welcome speech (M.M. Krishtal, Rector of the Togliatti State University)

**Section 1: Russian-Japanese Workshop on the structure and mechanisms of plasticity of advanced magnesium alloys and related materials** (Experimental section on the microstructure, mechanical properties and deformation mechanisms in magnesium alloys)

### Microstructure and LPSO structure of Mg alloys

1.1. 09:15-09:45 M. Yamasaki, T. Matsumoto, K. Hagihara, T. Mayama, Y. Kawamura, Kink boundary formation in an 18R-LPSO structure of Mg-Zn-Y alloy

1.2. 09:45-10:15 K. Hagihara, M. Honnami, T. Okamoto, M. Yamasaki, T. Mayama, H. Izuno, T. Nakano, T. Ohashi, Y. Kawamura, Characteristic features of the deformation band formed in the synchronized LPSO phase

1.3. 10:15-10:45 S. Hosokawa, K. Kimura, M. Inui, Y. Kajihara, K. Matsuda, A. Q. R. Baron, M. Yamasaki and Y. Kawamura. Microscopic elastic properties of Mg<sub>85</sub>Zn<sub>6</sub>Y<sub>9</sub> alloy with LPSO phase studied by inelastic x-ray scattering

### **10:45-11:00 Coffee break**

1.4. 11:00-11:30 L. Rokhlin, E. Lukyanova, T. Dobatkina. Mg-rich parts of the ternary phase diagrams of magnesium with two rare-earth metals of different subgroups

### Deformation Mechanisms, Twinning

1.5. 11:30-12:00 M. Enoki, Y. Muto, T. Shiraiwa. Analysis of Dynamic Deformation Process in LPSO-Mg Alloys by Advanced Acoustic Emission Techniques

1.6. 12:00-12:30 T. Morikawa, K. Higashida. Plastic Strain Distribution around King Bands in LPSO Type Mg Alloys

### **12:30-14:00-Lunch**

- 1.7. 14:00-14:30 K. Higashida, T. Morikawa, M. Fujiwara. Inhomogeneities in deformation microstructures in metals
- 1.8. 14:30-15:00 K. Aizawa, AE and/or neutron diffraction analyses of deformation process in LPSO phase
- 1.9. 15:00-15:30 A. Vinogradov, E. Vasilev, D.L. Merson, Y. Estrin. Kinetics of twinning/detwinning in Mg alloys inferred from in-situ observations

**15:30-15:45 Coffee break**

Mechanical properties

- 1.10. 15:45-16:15 S. K. Shin. Deformation Behavior of Magnesium Single Crystals
- 1.11. 16:15-16:45 Y. Estrin, R. Lapovok, X. Gao, J.-F. Nie, S. N. Mathaudhu Improving the Mechanical Properties of Cast Mg-Y-Zn Alloy by Severe Plastic Deformation
- 1.12. 16:45-17:15 K. Máthis, J. Čapek, B. Clausen, G. Garcés, A. Vinogradov. In-situ investigation of deformation mechanisms in various magnesium alloys by neutron diffraction and acoustic emission
- 1.13. 17:15-17:45 D. Orlov, Prismatic precipitates and excellent performance in a wrought Mg-Zn based system

**Dinner (Park Hotel)**

**16 June 2015 (TSU, Belorusskaya 14B, Conference Hall, 2F )**

Deformation Processing of Mg Alloys and Corrosion Protection

- 1.14. 09:30-10:00 S.V. Dobatkin, Y. Estrin, S. Galkin, V. Serebryany, M. Diez. Microstructure, texture and mechanical properties of pure Mg and magnesium alloy Mg-Al-Zn-Mn after radial-shift rolling
- 1.15. 10:00-10:30 O. B. Kulyasova, R. K. Islamgaliev, Y. Zhao, R. Z. Valiev. Ultrafine-grained structure and enhanced mechanical properties of the Mg-Zn-Ca alloy
- 1.16. 10:30-11:00 D. Nugmanov, O.Sh. Sitdikov, M.V.Markushev, Effect of texture on anisotropy

of strength in ZK60 alloy: Experimental investigations and computer simulation

1.17. 11:00-11:30 A. Yu. Volkov. The improvement of magnesium plasticity through severe plastic deformation at room temperature

1.18. 11:30-12:00 M.M. Krishtal, P.V. Ivashin. New prospects of micro-arc oxidation for corrosion protection of Mg alloys

12:00-12:10 Closing Remarks

**12:10-12:40 Coffee break**

12:40-13:40 Laboratory Tour

**15:00-19:00 Boat tour along the Volga river and open discussion on board**

**17 June 2015**

**Transfer Togliatti - St. Petersburg (flight from Samara Airport, 17 June, 2015)**

## **Part 2: Conference sections in St. Petersburg**

**ITMO University, Birzhevaya Liniya 14, St. Petersburg  
(Rose Hall)**

**17 June-21 June 2015**

**17 June 2015**

Transfer Togliatti - St. Petersburg (flight from Samara Airport, 17 June, 2015), hotel check-in

**20.45–22.45 Welcome cocktail on the boat**

**18 June 2015**

08.00–09.00 Registration (Rose Hall)

09.00–09.05 Opening speech (A.E. Romanov, ITMO University)

09.05–09.10 Welcome speech (V.O. Nikiforov, Vice-Rector of the ITMO University)

**Section 1: Russian-Japanese Workshop on the structure and mechanisms of plasticity of advanced magnesium alloys and related materials** (Theoretical section on micromechanics of kinking, twinning and phase transformations in solids)

1.19. 09.10–09.40 F.S. Belyaev, M.E. Evard, A.E. Volkov. Modeling of plastic accommodation effect on martensite growth in shape memory alloys

1.20. 09.40–10.10 A.B. Freidin. Modeling of stress-assist chemical reaction front propagation in solids

1.21. 10.10–10.40 M.Yu. Gutkin, A.A. Lavrentiev. Five-fold twins in bulk nanocrystalline metals and alloys

1.22. 10.40–11.10 T. Mayama, T. Ohashi, Y. Tadano, K. Hagihara. Crystal plasticity analysis of kinking in HCP metals subjected to uniaxial compression

**11.10–11.40 Coffee break**

1.23. 11.40–12.10 R. Matsumoto, M. Uranagase. Atomistic study of kink deformation mechanisms of the long-period stacking-ordered phase

1.24. 12.10–12.40 A. Nakatani, X.-W. Lei. Mathematical foundation of kink deformation in layered solids

1.25. 12.40–13.10 T. Ohashi, T. Mayama, Y. Yasuda, Y. Kanazawa. Crystal plasticity finite element analyses on the development of deformation bands in LPSO phase in extruded magnesium alloys and their mechanical effects in later deformation

1.26. 13.10–13.40 I.A. Ovid'ko, N.V. Skiba, A.G. Sheinerman. Models for the formation of deformation twins and nanoscale cracks in nanocrystalline and ultrafine-grained materials

1.27. 13.40–14.10 A.A. Zisman. Detection and quantification of junction disclinations in IF steels by EBSD

**14.10–15.30 Lunch**

**Section 2: The International Workshop on multifunctional properties of bulk nanostructured metals and alloys**

- 2.1. 15.30–16.00 E.C. Aifantis. Gradient continuum micro/nanomechanics: Applications to advanced technology & emerging biomedicine problems
- 2.2. 16.00–16.30 A. Glezer, R. Sundeev, A. Shalimova. Reversible crystalline-to-amorphous state phase transitions at the severe plastic deformation
- 2.3. 16.30–17.00 A. Vinogradov. Current issues in strength and ductility of ultrafine grained metals
- 17.00–18.00 **Poster Session** (coupled with the 2<sup>nd</sup> coffee break, the 6<sup>th</sup> floor, co-working class)

## **19 June 2015**

### **Section 2: The International Workshop on multifunctional properties of bulk nanostructured metals and alloys (Continuation)**

- 2.4. 09.00–09.30 V.V. Rybin. Fragmentation and rotational modes at the stage of developed plastic deformation of crystalline solids
- 2.5. 09.30–10.00 J. Llorca. Mechanical behavior of metallic and metal-ceramic nanoscale multilayers
- 2.6. 10.00–10.30 R.Z. Valiev. Grain-boundary engineering of bulk nanomaterials for advanced application
- 2.7. 10.30–11.00 N.A. Enikeev, M.M. Abramova, M. Murashkin, R.Z. Valiev, X. Sauvage. Grain boundary segregation and hardening in UFG Al and Fe alloys produced by high pressure torsion
- 2.8. 11.00–11.30 I. Sabirov, M.Yu. Murashkin, N.A. Enikeev, R.Z. Valiev. High strength Al-Mg alloys via physical simulation

### **11.30–12.00 Coffee break**

### **Section 3: The International Workshop on the structure and properties of advanced functional nanomaterials for photonics and other applications**

- 3.1. 12.00–12.30 K.E. Aifantis. Understanding fracture in Si anodes: Experiments and simulations
- 3.2. 12.30–13.00 A.A. Vikarchuk, A.E. Romanov. Metallic materials with developed surface
- 3.3. 13.00–13.30 L.M. Dorogin. Tribology of nanowires

### **13.30–15.00 Lunch**

- 3.4. 15.00–15.30 Yu.N. Gornostyrev, L.E. Karkina, I.N. Karkin, A.R. Kuznetsov, I.K. Razumov, P.A. Korzhavyi. Solute – grain boundary interaction and segregation formation in Al: First principles calculations and atomistic modeling
- 3.5. 15.30–16.00 V.I. Nikolaev, A.I. Pechnikov, M.G. Mynbaeva. Substrates for epitaxial growth of GaN:Mg based structures
- 3.6. 16.00–16.30 E. Shulga, I. Kruusenberg, M. Vikkisk, U. Joost, I. Kink, K. Tammeveski. Highly active nitrogen doped carbon based nanocomposites for oxygen reduction reaction in alkaline media

### **16.30–17.00 Coffee break**

- 3.7. 17.00–17.30 K. Sapozhnikov, S. Golyandin, S.B. Kustov. Mechanical spectroscopy of Mg-based fiber reinforced composites
- 3.8. 17.30–18.00 V.E. Bougrov, V.I. Nikolaev, K.D. Mynbaev. Modern trends of semiconductor materials for LED technology development

18.00–18.10 Closing remarks and summing-up

19:00–24.00 Conference Dinner (Trojka Restorant, Zagorodny Ave. 27/21, Zvenigorodskaya metro station, ~ 200 m)

**20-21 June 2015** Hotel check-out, transfer to airport

### **List of posters**

1. M.M. Abramova, N.A. Enikeev, M.V. Karavaeva. Microstructure and strength of 0.6C-18Mn TWIP steel produced by high pressure torsion
2. E.V. Bobruk, M.Yu. Murashkin, X. Sauvage. Microstructure of binary aluminum systems Al-Zn with various Zn-content after high pressure torsion
3. E.V. Boltynjuk, D.V. Gunderov, A.A. Churakova, E.V. Ubyivovk, A.Yu. Churyumov. Atomic structure of Ti-Ni-Cu and Zr-Cu-Al-Fe-Dy amorphous alloys subjected to SPD-deformation
4. G.S. Dyakonov, I.P. Semenova, S.Yu. Mironov, A.V. Polyakov, R.Z. Valiev. Features of deformation induced boundaries formation in Ti Grade 4 during ECAP-Conform
5. L.I. Guzilova, V.I. Nikolaev, V.N. Maslov, V.L. Abdrachmanov, D.V. Zav'yalov, E.S.

- Vasilyeva, A.E. Romanov. Elastic properties and nanohardness of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> single crystals
6. M.V. Karavaeva, S.K. Kiseleva, A.V. Ganeev, N.G. Zaripov. Superior strength of an ultrafine-grained carbon steel
  7. N. Kazarinov, I. Lomakin, R.R. Valiev. Mechanical behaviour of UFG Ti alloys with protective coating
  8. E.S. Kolodeznyi, M.A. Shvaleva, A.E. Romanov, V.E. Bougrov. Heat management of phosphor layers with various matrices in high power LEDs
  9. A.M. Mavlyutov, I.A. Kasatkin, M.Yu. Murashkin, R.Z. Valiev, T.S. Orlova. Improvement of functional properties of nanostructured Al-Mg-Si alloy by dislocation density increase
  10. A.E. Medvedev, M.Yu. Murashkin, R.Z. Valiev. Influence of severe plastic deformation on microstructure, mechanical and electrical properties of alloy Al-2Fe
  11. M.A. Shvaleva, E. Shulga, I. Kink, A.E. Romanov, K.D. Mynbaev, V.E. Bougrov. New type of liquid glass-based composite phosphor material for effective light conversion
  12. V.D. Sitdikov, E.V. Bobruk, M.Yu. Murashkin, P.S. Chizhov. X-ray analysis of phases composition in Al alloy after SPD and artificial ageing
  13. A.M. Smirnov, V.E. Bougrov, J.S. Speck, A.E. Romanov. Modeling misfit stress relaxation via non-basal dislocations in III-nitride semipolar layered structures
  14. A.L. Kolesnikova, T.S. Orlova, I. Hussainova, V.E. Bougrov, R.Z. Valiev, A.E. Romanov. Mesoscopic description of high-energy grain boundaries in graphene
  15. M.V. Dorogov, A.N. Priezzheva, K.N. Tukmakov, V.S. Pavelyev, M.N. Tyurkov, A.A. Vikarchuk, L.M. Dorogin, A.E. Romanov. Cavity formation mechanisms in copper icosahedral small particles as a result of annealing